

Vision for Electronic Document Creation and Maintenance

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INTRODUCTION

In the course of its deliberations, the IPT described an approach for creating and maintaining standardization documents, which is fundamentally different from the way documents are created and maintained today and what is proposed in Tab D1.01. Emerging information technologies increasingly offer opportunities to redesign the document creation and maintenance processes, perhaps redefining what constitutes a “document.” In this document, we describe one potential vision of such a process, which can be viewed as having near-, mid-, and long-term elements.

CURRENT SITUATION

Today, Preparing Activities (PA) develop standardization documents by using word processing software. Draft documents typically are stored on either local servers or individual personal computers. Final documents are converted to Adobe PDF files and uploaded into ASSIST via the EDS module. The Defense Automation and Production Service (DAPS) performs a quality control check on the uploaded document, and any document that fails the quality control screen must be corrected by the PA and resubmitted.

Documents are developed in accordance with the formatting guidance in MIL-STD 961/962. PAs may use predefined templates, edit existing documents, or create new documents from scratch. To the distribution mechanism at DAPS, it simply does not matter.

Documents contain both administrative and technical information. Changes to the administrative information, technical requirements, or both can trigger a document revision. Currently, changes to documents are published either as Change Notices or Amendments or as a new revision of the document. While information technology has greatly improved the process of creating documents, the documents essentially are still created in a way similar to typewritten, paper-based documents before the introduction of word processors.

DEFINITION OF NEED OR OPPORTUNITY

Standardization documents convey information to users. A traditional document in electronic form, such as a PDF file, is essentially an electronic version of a paper-based product. This stands to reason because, before computers and databases

existed, paper files served as a repository for data and information. The document provides the content, structure, and “index” to help a user locate information.

While traditional, stand-alone documents continue to offer conveniences to users, they pose a workload challenge when updates are required. Changes to the administrative information, technical requirements, or both can trigger a document revision. In the traditional approach, changes to common or repetitive information that applies to multiple documents are not commonly executed. Instead, each document is individually edited to make the corrections.

In contrast, new technologies that allow data to be linked and managed, such as relational databases and XML, offer the potential for making global changes to such common information, thereby vastly improving the efficiency of preparing and revising documents. These new technologies can allow document developers to dynamically generate documents from database fields. Databasing of information common to multiple documents allows global changes applicable to multiple documents to be effected quickly and easily. This would eliminate much manual updating of individual document files.

Another potential advantage of generating documents from databases is that data could be validated at the time of entry, and the database could be programmed to produce an accurately formatted document every time. The software also might allow users to customize how the information is presented. For example, a user might generate, on demand, either a full version of the document, selected sections, or just the latest changes. The user also could elect to receive the document in a word processing format, as a PDF file, or downloaded in other formats.

Likewise, requirements and verifications stored in databases can be linked both within documents and across other documents to alert technical authors that changes are being proposed that might affect them. Like the original ASSIST program, which gave visibility to references and referencing, new technologies allow us to increase the fidelity on such linking and, by using other enhanced capabilities being proposed for the current ASSIST, affected parties can be involved in the review process associated with changes which may affect them.

Changing from a document-based paradigm to a requirements-based paradigm allows us to accelerate the revision process. Frankly, it has the potential to eliminate the process as we know it today. Documents, which are controlled at the requirement/verification level, are “always current.” While this may seem far-fetched, if all requirements and verifications are up-to-date at the time when the customer accesses the document, the document is always created “fresh.”

RECOMMENDATIONS

Recommendation #1

In the mid-term, the DSPO should consider extracting administrative information from standardization documents and capturing them as data elements. This information would be updated dynamically and would print as a separate administrative page on demand by the customer. Global administrative changes could be made by document authors or by DAPS. Further details on the concept of removing administrative information from standardization documents are explained in the Concept Discussion. Consideration should be given to the creation of a new administrative data page. A notional example is provided in Figure 1. In addition, document ownership information could be captured, as notionally represented in Figure 2. This effort also should include integration of the ASSIST Document Analysis page information.

Recommendation #2

In the long-term, the DSPO should consider capturing both administrative and technical information as data elements. Such data elements could be assembled, on demand, into a prescribed format, whether for printing or viewing the entire document. Document users would have various options available for viewing or downloading the document, and document authors would be able to make global changes easily. This recommendation is integral to automating the entire life cycle of DSP documents. For a more detailed understanding of this recommendation, examples of data elements are described below in the Concept Discussion under “Automating the Entire Document Content and Lifecycle.”

Recommendation #3

In the near-term, the DSPO should provide the document user with a new view of document administrative data, separate from technical data, which would allow the document developer and user to more easily manage administrative data. DSPO should add an option within ASSIST to allow users to request to view or print document administrative data. The administrative data should include data not currently contained in ASSIST, such as validation date and Preparing Activity contact point information (i.e., name and phone number).

Recommendation #4

Also in the near-term, the IPT recommends changes to MIL-STD 961/962 that would use (1) a generic beneficial comments statement that would direct users to ASSIST On-Line for the current Preparing Activity of record and (2) a generic statement after the “concluding material” requirement in standardization documents that would direct users to the ASSIST On-Line for the document’s current point of contact.

CONCEPT DISCUSSION

DSP documents typically are composed of the following basic data elements:

- 1) Administrative data
 - Cover Page (see Figure 1 for one sample)
 - Administrative information
 - External (ASSIST-type data about the document and its owner)
 - Internal (internal references)
- 2) Requirements
 - General
 - Specific
- 3) Verifications
 - General
 - Specific
- 4) References (Classic Section 2)
- 5) Supplemental data
 - Appendices
 - Links to other files
 - Websites
 - Programs
 - Graphics
 - Movie files
 - Training materials
 - Templates and feedback forms
 - And others

Figure 1. Possible Standard Template for DSP Cover Page

NOT
MEASUREMENT
SENSITIVE

MIL-(DOC ID)
Month
YEAR
Superseding
MIL-(DOC ID)
Month
YEAR

DEPARTMENT OF DEFENSE
DOCUMENT TYPE



DOCUMENT TITLE

AMSC N/A

FSC 00GP

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

Figure 2. How Others Are Capturing and Providing Document Administrative Data

The figure displays four screenshots of the 'DLA 13 Vision for Electronic Document Creation and Maintenance' software interface, arranged in a 2x2 grid. Each screenshot shows a different tab of the application.

- Top Left (General tab):** Shows document metadata including Type (Microsoft Word Document), Location (A:), Size (45.0KB (46,080 bytes)), MS-DOS name (DLA13V~3.DOC), and creation/modification/access dates. It also includes checkboxes for attributes: Read only, Hidden, Archive (checked), and System.
- Top Right (Summary tab):** Shows document history including Created, Modified, Accessed, and Printed dates/times. It also lists the last saved by (Robert B. Kuhn), revision number (2), and total editing time (37 Minutes).
- Bottom Left (Statistics tab):** Displays a table of document statistics.
- Bottom Right (Custom tab):** Shows a form for customizing document metadata, including Title, Subject, Author, Manager, Company, Category, Keywords, Comments, Hyperlink base, and Template.

Statistic name	Value
Pages:	9
Paragraphs:	72
Lines:	245
Words:	1895
Characters:	11197
Characters (with space...):	13101
Bytes:	100352

AUTOMATING THE DOCUMENT CONTENT AND LIFE CYCLE

Document Storage

All DSP documents are stored in a central location for secure access and efficient management. For the sake of current discussion, consider this as being the ASSIST program at DAPS.

Document Ownership

Preparing Activities designate responsible people to manage an automated document life cycle process that includes creation, coordination, promulgation, revision, conversion, cancellation, and archiving. These designated employees are given access rights and privileges into a Document Life Cycle Management module within ASSIST. People without access rights are unaware of the module or denied access.

Project Management

A designated person opens the project. Involved and interested technical personnel are notified that the project is starting, what documents are involved, other people involved (creating a virtual IPT), and the milestones and deadlines. Taskings begin.

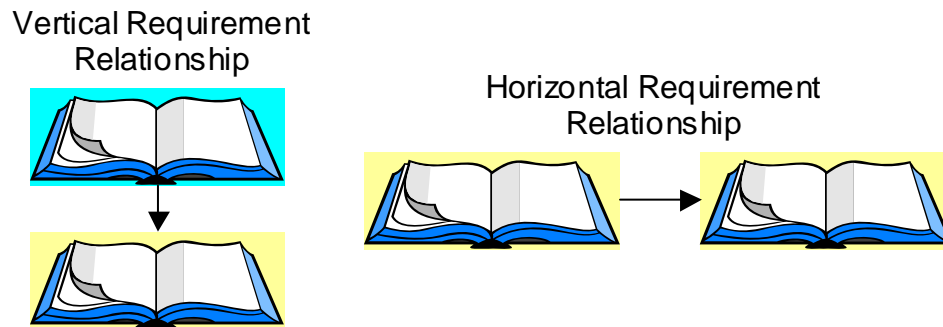
Document Creation/Maintenance

Tasked personnel are then given secure access to the designated document in an editing mode. The entire document might consist of data fields to be populated with administrative and technical content. A menu-driven system could offer different document type selections, each with its own standard set of fields and layouts. The preparer also might be able to tailor a document from the fields available if the standard document layouts do not apply. Changes are made electronically, cataloged, and configuration-controlled as the document project progresses.

Requirements/Verification Management

Just as the original ASSIST program was designed to reveal references in one document to another, there is also a relationship of the requirements and verifications in one document to another. Top-level requirements force the adherence to lower levels requirements, and lower level verifications are designed to support higher level, weapon system operational verification and test. A document management system of the future could “link” such requirements and verifications, making it easier to see and manage the relationships and potential impacts of changing such requirements and verifications. (See Figure 3.)

Figure 3. Types of Inter-Document Relationships



Project Visibility

There are two types of DSP customers: users and potential reviewers. Users are document requestors who are given access only to the previous approved version and to the information that a project is underway and the project members. Potential reviewers have special interest in the document and its requirements. They are valuable allies to the government technologists who manage the document. Ideally, ASSIST will notify both users and potential reviewers that a project is underway. Users have the option of moving closer to the document (i.e., to become reviewers) and, potentially, of better satisfying government needs.

Document Coordination

After the document has been revised, it is given official draft status. It is posted to a Web site as a draft where interested parties may make comments. These comments are allowed and managed using a document development and coordination tool as described in Tab D1.01. That is, comments are entered into the database, making them easy to sort, review, and adjudicate.

Comment Management

After completion of a commenting period, the Preparing Activity begins the actual revision process, adjudicating comments, providing feedback to commenters, and incorporating appropriate changes.

Document Approval

Revised documents, before release for acquisition purposes, should be reviewed and approved by the appropriate approval authority. For many people, workflow functionality would be helpful at this stage. In truth, workflow functionality enhances the entire process, from creation to destruction or archiving. Workflow provides a variety of attributes that enhance the process, from increased discipline to a clear measurement of efficiencies or constraints.

Document Publishing

After a document is approved, the Preparing Activity prepares to submit the document to DAPS for distribution. This process involves updating all ASSIST data associated with the document. This process must be completed for two reasons. First, it allows the document storage process to start. Second, this same data comprises the information that allows the dynamic creation of the document for the customer. Depending on several factors, the process is complete when the PA correctly fills in all the necessary data and submits the document for storage and, later, distribution to customers. In a system where the data is pre-validated at time of entry, “publishing” the document to ASSIST might be as simple as locking the record from further change and clicking a button to make the data available to ASSIST users. The software then would interact with the users, allowing the document to be presented to the user in various formats described below.

Document Distribution

The “dynamic” creation of the document begins when a customer requests access to the document. Depending on the medium chosen, electronic or paper, and the type of action accomplished at the time of the last review, the customer will get certain portions of a document. This might include

- υ cover page,
- υ administrative page,
- υ a combination of the two pages,
- υ basic document content, appendices (all or selected ones), and
- υ referenced documents.

Data that “surrounds” the technical content of the document is largely (but not completely) administrative and automated.

The “Document of the Future” would automate the creation and maintenance of all of the above-mentioned elements. Recommendation #1 allows information to be split into fairly large bites (the document, the cover page, and an administrative page). Recommendation #2 provides finer fidelity. In Recommendation #2, the stored data elements could be assigned to various technologists or administrators. Access is controlled to authorized authors to make changes and record rationale for such changes in an automated way. Customers can follow along and make comments specifically at the requirements level. In some respects, this makes the paper-based document concept obsolete. When the choice is made to request information, customers can choose a whole document or part of a document and all its accompanying information.

The futuristic vision of a document creation and maintenance system described above must be able to address certain aspects and complexities that are easily understood and managed in today's process. Following are some of these complexities:

- ◆ The need to archive all versions of a data-driven document for historical and contract compliance reasons;
- ◆ The ability to control and limit access privileges for changing administrative and technical data fields;
- ◆ The ability to "lock" a document's data elements and issue date;
- ◆ The ability to easily create unique document types and formats from existing data elements;
- ◆ The ability to create, store, and insert unique tables, drawings, figures, and so forth using a data-driven document system.

The pace of computer hardware and software technology growth suggests that the capabilities described in this vision will be available in the not-too-distant future. Many are already available to some degree, but have not been used to replace traditional word processing documents. For example, word processing software functions, such as mail merge and field insertion, allow parts of traditional documents to be created from database fields. The IPT does not know if the concepts expressed here would be feasible for some or all of the DSP's document needs in the future, however, we believe the DSPO should further study the concept as technology matures.